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PETROGRAPHY.[1]

Some Basalts of Asia Minor.—The rocks near Kula, Asia Minor, are basalts in sheets and lava streams, the latter emanating from a number of old volcanic centers whose cores may still be distinguished. These basalts, according to Washington,[2] are hornblende-plagioclase basalts, characterized especially by the abundance of their hornblendic component. This mineral, augite and olivine are present as phenocrysts in a groundmass made up of plagioclase, magnetite and glass, the latter being lighter in color as the magnetite in it increases in quantity, thus indicating that this mineral was one of the latest separations from the magma. Leucite was discovered in two of the streams. It presents no unusual features. The mineral is rare in hornblendic basalts elsewhere. None of the components of the rocks merit special mention but the hornblende. This is always porphyritic and is present in large quantity. Its color is yellow, brown or greenish-yellow, and its extinction varies from 4° to 23°. The chemical alterations effected in the mineral by magmatic resorption are interesting. One effect is the replacement of the hornblende by a reddish-brown mineral associated with colorless augite and opacite, and another is its partial or complete alteration into augite and opacite. The brown mineral is referred to hypersthene, although the analysis of a portion of the rock containing a large quantity of it was rather against this theory. The author thinks that the formation of the mineral was probably due to the reducing action of hydrogen (from dissociated water included in the lava) upon the ferric iron of the hornblende. In structure the basalts are normal, hyalopilitic, semi-vitreous and tachylitic. An analysis of a leucite variety gave:

SiO_2	Al_2O_3	Fe_2O_3	FeO	CaO	MgO	Na_2O	K_2O	P_2O_5	H_2O	Total
47.74	20.95	3.29	6.32	7.56	5.16	7.12	1.21	.13	.04	= 99.52

Since the hornblende is of primary importance in the basalts of Kula, it is proposed to call them, and other basalts in which hornblende predominates over augite and olivine, by the name of Kulaites.

The Igneous Rocks of the Eureka District.—In an appendix to the Geology of the Eureka District, Iddings[3] gives an account of the igneous rocks of the region with special reference to the lavas whose studies led Hague to the proposal of the theory that the various types of rocks in the Eureka district are differentiated portions of one magma, which split up into two, one yielding feldspathic acid rocks and the other pyroxene basic ones. Among the intrusive rocks of the region Iddings mentions only granites, granite-porphyries and quartz-porphyries. The volcanic rocks include hornblende-andesite, hornblende-mica-andesite, dacite and rhyolite, which are the types derived from the more acid portion of the original magma, and pyroxene-andesites and basalts derived from the basic portion. The pyroxene-andesite contains anorthite, hypersthene, augite, hornblende, a little biotite and an occasional quartz grain, in a glassy groundmass with a felt-like structure produced by labradorite and augite-microlites. The hornblende-mica-andesites are more acid. They contain labradorite, hornblende, biotite and a little quartz as porphyritic crystals in a micro-crystalline groundmass of lath-shaped plagioclases and intergrowths of feldspar and quartz. The dacites are rare. They possess macroscopic quartz-phenocrysts together with hornblende, hypersthene, a little augite, biotite, labradorite, anorthite, and possibly orthoclase in a pumiceous glass base, which also often contains many beautifully crystallized zircons. The rhyolites met with present few characters of special interest. They vary in the texture of their groundmass from micro-crystalline to glassy varieties. Their sanidine phenocrysts have the plane of their optical axes sometimes in the plane of symmetry and sometimes perpendicular thereto. Occasionally the rock possesses also phenocrysts of hypersthene. The basalts are poor in olivine, and this mineral when present is often changed into serpentine or into the reddish-brown substance to which Lawson has given the name iddingsite. Hypersthene is present in some of the sections, and in others are a few grains of quartz surrounded by augite borders.

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[1] Edited by Dr. W. S. Bayley, Colby University, Waterville, Maine.

[2] Amer. Jour. Sci., Feb., 1894, p. 114.

[3] Monograph XX U. S. Geol. Survey, p. 337.

Notes from Minnesota.—In a preliminary report of a season's field work in northeastern Minnesota, Elftman[4] refers to the gabbro of the region as producing contact metamorphism in the slates and schists to the north of it. He describes more particularly the actinolite-magnetite slates, from near Birch Lake, that are believed to have originated in a fragmental rock whose nature, however, is not fully set forth. The gabbro is an olivinitic variety. In it are great masses of anorthosite regarded by the author as phases of the gabbro. This is the rock which was reported by Lawson[5] as representing an old basement lying unconformable beneath the gabbro.

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[4] 22d Ann. Rep. Geol. & Nat. Hist. Survey of Minn., p. 141.

The Geology of Dartmoor, England.—McMahon[6] gives a few brief descriptive notes on some trachytes, felsites, mica-diorites, dolerites, tuffs and hornblende-schists from the western flank of Dartmoor. The trachytes and felsites are more or less altered, and the tuffs always very much so. The tuffs contain fragments of several kinds of lavas and of altered sedimentary rocks. The cementing material is " like the microgranular base of some rhyolites and porphyries." The most interesting rocks are the hornblende schists, which are thought by the author to be altered basic tuffs. They are marked by a fine grained parallelism of their constituents, producing a structure which the author designates the "corduroy structure." The rocks consist of augite, secondary hornblende and feldspar, the first two of which are often well crystallized. Their alteration is thought to be due to the intrusion of the tuffs by the great mass of epidiorite of the Cock's Tor. The basic schists of the Lizards that have been so repeatedly discussed, are believed to have had a similar origin.

Miscellaneous Notes.—The study of a series of nepheline rocks leads Gentil[7] to the conclusion that the peg structure so characteristic of this mineral is an effect of alteration. The alteration product is often a hydrated pleochroic substance with a yellowish tinge. The 'pegs' are produced by the extension of this substance along directions of feeble cohension in the original mineral (solution planes?)

The rock by whose decomposition the apophyllite[8] of Callo in Algeria was formed, is a biotite-augite-andesite, whose groundmass is usually more altered than the phenocrysts. The inclusions found in the rock are of cordierite gneiss, fragments of andalusite and of sillimanite and large segregations of plagioclase a little more basic than the feldspar of the phenocrysts.

On account of the similarity in crystalline structure between flint and Arkansas whetstone, Rutley[9] is inclined to regard the latter rock as derived by the replacement of limestone or dolomite by silica. The rhombohedral cavities noted by Griswold are thought to have been produced by the solution of some crystals of calcite or dolomite that remained for a time in the midst of the replacing silica after all the rest of the carbonate had been removed.

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[5] Bull. No. 8, Geol. & Nat. Hist. Survey of Minn.

[6] Quart. Jour. Geol. Soc., 1894, p. 338.

[7] Bull. Soc. Franc. d. Min., xvii, p. 108.

[8] Ib., p. 11.

[9] Quart. Jour. Geol. Soc., 1894, p. 377.

Pearce[10] gives a series of analyses to sustain his theory that the free gold of the Cripple Creek District, Colorado, has been mainly derived from the oxidation of tellurides.

In a preliminary report on the Rainy Lake Gold Region in Minnesota and Manitoba, H. V. Winchell and U. S. Grant[11] give some brief notes descriptive of the Laurentian, Coutchiching and Keewatin rocks of the district.

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[10] Colo. Scient. Soc., April 5, 1894.

[11] 23d Geol. & Nat. Hist. Sur. of Minn., p. 36.